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Foundations of AI

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Assignment 2: Search - Question 3 a\* and ucs

**Run both A\* and uniform cost search (i.e. using  $h_1: h=0$  for all states) on the MarsMap and count the number of states generated**

I was provided a map (page 2) of mars for a rover to traverse through. The white tiles are safe to move to while the red tiles are not. Starting from location 1-1, I have to navigate the rover to location 8-98.

First, I used **Uniform Cost Search**. This search tries every possible combination of paths in order to find the most efficient path at the end. Since it is doing absolutely everything possible, the **number of states generated totaled to 32**, which equates to the total number of white tiles present.

Next, I used the **a\*** algorithm. This search is basically Uniform Cost Search but it has knowledge. If there is some sort of knowledge on how to get to the goal, then its efficiency will be increased. **The number of states generated totaled to 24**, which is a massive decrease

		(8,3)	x	x	x	x	Samples (8,8)
					x		
(6,1)				x	x	x	x
(5,1)	x	x	x	x			x
			x				x
			x	x	x	x	
(2,1)						x	
Charger (1,1)	(1,2)	x	x	x	x	x	